

## BEST PRACTICE PROGRAMME

# Good Practice — Case Study

# 23

### Potential Users

National Health Service and commercial laundries

### Investment Cost

£6,480 for two calenders (1989 prices)

### Savings Achieved

Energy savings = 811 GJ/year worth £1,700/year.

Non-energy savings = £3,040/year. (1989 prices)

### Payback Period

1.4 years

### Case Study Summary

Whipps Cross Hospital laundry is typical of many laundries, both in the commercial sector and NHS, in that it uses old calenders which are substantially less efficient than more modern machines. Although calendering is a relatively efficient method of moisture removal, the quantity of flatwork processed by this laundry means that the calendering section uses a significant proportion of the total laundry energy consumption. In common with many other laundries, the four calenders were producing a great deal of airborne lint which required expensive cleaning at regular intervals, and made the working environment uncomfortable, reducing the performance and morale of the operators.

In an effort to improve this situation, covers

were fitted to all the calenders in early 1989.

These were claimed to improve energy efficiency by reducing the heat losses from the calender's upper surfaces and to improve the local atmosphere by reducing the quantity of lint and moist air escaping into the laundry. This case study examines the savings (both energy savings and others) achieved by the installation of the covers, and assesses any drawbacks which may have become apparent after extended use.

### Host Organisation

Whipps Cross Hospital Laundry  
(Waltham Forest Health Authority)  
Whipps Cross Road  
Leytonstone  
London E11 1NR  
Tel No: 081-539 5522

### Monitoring Contractor

British Textile Technology Group  
Wira House  
West Park Ring Road  
Leeds LS16 6QL  
Tel No: 0532 781381  
Ms V R Joy

### Equipment Manufacturer

Arden Laundry Power Systems Ltd  
Unit 6, Carver Road  
Astonfields Industrial Estate  
Stafford ST16 3HR  
Tel No: 0785 211406  
Mr W F Murray

## CALENDER

## COVERS IN

## A HOSPITAL

## LAUNDRY



Covers fitted to machines



**Energy Efficiency Office**  
DEPARTMENT OF ENERGY



## The Covers

The covers, which are constructed of metal frames with clear plastic panels, fit over the calender bed and rolls. They reduce heat loss from the rolls and the unclothed "shoulders" of the beds by containing hot air which would otherwise escape into the laundry; this limits the convective and radiative losses from the calender's upper surfaces. In addition, the air which is drawn through the rolls to remove moisture from the fabric is now hotter and of lower relative humidity than that prior to modification. This contributes to an overall improvement in the calenders' efficiency.

## Installation and Maintenance

Installation of the four covers was carried out over two weekends without disruption to production. They can be readily lifted and removed by two people if necessary, but removal is seldom required as the covers have telescoping sections sliding on rails and remain in position for all normal operations including re-clothing the rolls, waxing and renewal of



*Covers improve laundry environment*



*Covers fully fitted*

tapes. They cause only minimal impedance to clear vision of the beds and have proved themselves robust and serviceable over 12 months' use.

## Calenders

The specification of the calenders for which results are quoted are:

- a four roll Tullis with 24 inch diameter heated rolls, three rolls having suction, manufactured 1972;
- a six roll Tullis with 20.5 inch diameter heated rolls, four rolls having suction, manufactured 1966.

## Energy Savings

The 4-roll Tullis calender, which processes

processing 100% cotton top sheets. Although the calenders can be run at faster speed and still achieve effective drying, shortcomings due to their age have prevented this from being translated into a higher production rate. Thus, potentially greater savings due to improved productivity have not been realised.

As a result of fitting the covers to these two calenders, estimated total annual steam savings of 204,800 kg, equivalent to 811 GJ of primary energy were achieved. As the covers themselves have no power requirement, this is a net saving.

Had it been possible to improve productivity as a result of the higher calendering speeds possible with the covers in use, greater steam savings could have been expected due to reduced annual operating hours. Electricity savings would also have resulted in this case.







**Calender with cover removed**

Cover	Specific steam consumption kg/kg moisture	Steam consumption rate kg/min	Moisture removal rate kg/min	Calender speed ft/min	Production rate sheets/min
<b>4 roll, top sheets</b>					
without	1.81	8.09	4.47	112	11.8
with	1.68	7.10	4.22	118	11.3
change	-7.0%	-12.2%	-5.6%	5.4%	-4.8%
<b>4 roll, draw sheets</b>					
without	2.01	4.35	2.17	62.5	12.6
with	1.93	4.29	2.22	66	12.7
change	-4.0%	-1.4%	2.7%	5.6%	0.6%
<b>6 roll, draw sheets</b>					
without	2.41	6.11	2.54	60	13.1
with	2.11	5.02	2.38	78	15.3
change	-12.1%	-17.8%	-6.5%	30.0%	16.8%

amounted to 5 operator hours per day for approximately 10 weeks duration. At an hourly employment cost of £3.87 per operator, the annual value of this for the 4-roll and 6-roll calenders is £484.

The additional cost of cleaning the covers at monthly intervals, which amounts to £113/year per cover, must be offset against these savings. This results in a cost of £226/year for the two covers. However, this is considered a small price to pay for the benefits gained.

The net cost savings accruing from the installation of two covers therefore amount to £4,511.

#### **Payback Period**

The installation costs for the 4-roll cover and the 6-roll cover are £2,995 and £3,485 respectively. **The simple payback period is therefore 1.4 years.**

#### **Cost Saving**

Steam is generated centrally by the hospital and distributed to the laundry where its consumption is metered and later charged against the laundry budget. The energy savings achieved have been assessed on the basis of a steam cost of £8.27 per 1,000 kg (1989 prices). For the two calenders examined, the energy savings were £1,694/year.

In addition to the energy savings, substantial benefits have been achieved in other areas. Before the covers were fitted, the laundry required thorough cleaning at monthly intervals to minimise the risk of fire by removing lint from high level surfaces. The reduced quantity of lint in the atmosphere has meant that this cleaning requirement has been cut by half; 50% of this saving can be attributed to the two covers under consideration. At a cost of £853 per clean, the saving is worth £2,559/year.

Improved environmental conditions have eliminated the need for some of the extra staff breaks which were previously allowed during the summer season; the additional working time in the whole calendering section



**Monitoring condensate temperature**



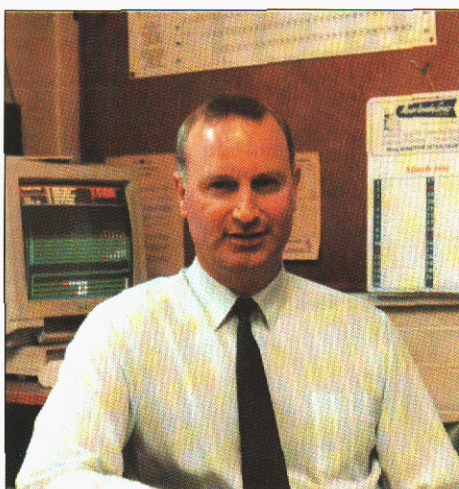
## Waltham Forest Health Authority's Experience

This project has been incorporated into an overall energy strategy for the laundry, and is considered by Waltham Forest Health Authority to have been a success. Furthermore, the research undertaken for the scheme within the total concept has enhanced a greater interest and awareness within the laundry management structure as to how efficiently the energy is utilized, and the results achieved.

The internal cleaning of the covers has proved more difficult than originally anticipated, although this is offset by the reduced amount of lint suspended in the atmosphere and the reduced high level cleaning.

The act of fitting covers to a large plant in the main production area for all to see has not only provided the predicted improvement in the environment but, in addition, has improved staff morale at a critical time.

Unfortunately, due to limitations on equipment attributable to age, the theoretical savings have not fully materialized, and are demonstrated by an element of overdrying. Nevertheless, the scheme has been a financial success.



### Whipps Cross Hospital Laundry

The laundry serves four hospitals within Waltham Forest Health Authority, processing approximately 180,000 items per week through three tunnel washers and several washer extractors. Although patients' clothing, nurses' uniforms and the full range of hospital work is processed, the majority of the work consists of bedlinen and theatre greens which are dried

through one of the four steam heated calenders. In 1988 the Health Authority's District Works Department, conscious of the cost of cleaning lint from the laundry surfaces and the heat losses from the four calenders, sought a solution and the covers were installed in early 1989.

A handwritten signature in black ink, appearing to read "R W Hollis".

R W Hollis  
District Engineer  
Waltham Forest Health Authority

*The installation described here was selected as an example of Good Practice, which is one element of the Energy Efficiency Office's (EEO) Best Practice programme, an initiative aimed at advancing and promoting ways of improving the efficiency with which energy is used in the UK.*

**For further information on this or other industrial projects, please contact the Energy Efficiency Enquiries Bureau, the Energy Technology Support Unit (ETSU), Building 156, Harwell Laboratory, Oxon OX11 0RA. Tel No: 0235 436747. Fax No: 0235 432923. Telex No: 83135.**

**For information on buildings-related projects, please contact the Building Research Energy Conservation Support Unit (BRECSU), Building Research Establishment, Garston, Watford, WD2 7JR. Tel No. 0923 894040. Fax No. 0923 664097. Telex No: 923220.**

**Information on participation in the Best Practice programme and on energy efficiency generally is also available from your Regional Energy Efficiency Office.**

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